(12) UK Patent Application (19) GB (11) 2 199 734 (13) A

(43) Application published 20 Jul 1988

(21) Application No 8728007

(22) Date of filing 30 Nov 1987

(30) Priority data
(31) 45758 (32) 11 Dec 1986 (33) IT

(71) Applicant
Industrie Zanussi S.p.A

(Incorporated in Italy)

Via Giardini Cattaneo 3, 33170 Pordenone, Italy

(72) Inventor
Giosue Meret

(74) Agent and/or Address for Service
J A Kemp & Co
14 South Square, Gray's Inn, London, WC1R 5EU

(51) INT CL⁴
A47L 15/22

(52) Domestic classification (Edition J):
A4F 29A1E1B2 29A1E4A
B2F 135 337 345 KD

(56) Documents cited
None

(58) Field of search
A4F
Selected US specifications from IPC sub-classes
A47L B08B

(54) Dishwasher with rotary spray arm having means for selectively altering spray direction

(57) A dishwasher comprising wash chamber 5, baskets, 6, 7 for supporting articles to be washed, and rotary spray arms 9, 11 for spraying wash liquid at the articles is characterised in that rotary spray arm 11 is provided with a manually adjustable, apertured slider 23 whereby jets of wash liquid may be selectively directed upwardly through apertures 12 or downwardly through apertures 22. In a modification, the rotary spray arm 11 is only provided with apertures 12, a removable plug opposite supply pipe 15 and is mounted in such a way that, ater removal of the plug, it can be inverted and re-mounted, so that, in use, jets of wash liquid may be directed downwardly instead of upwardly.

Fig.4.

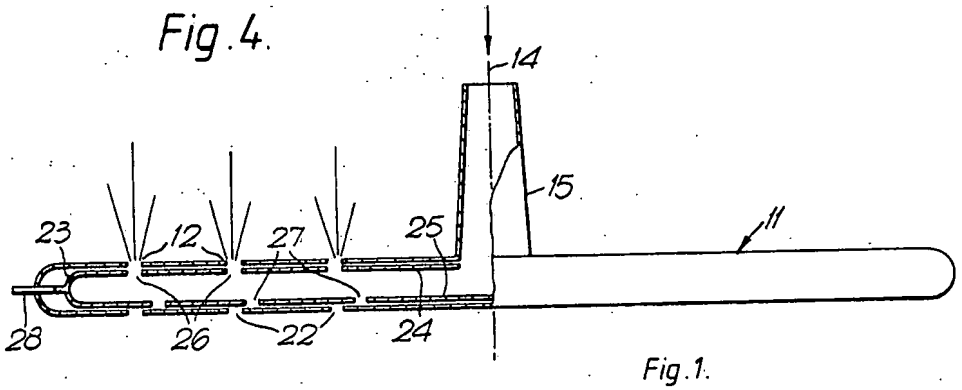

Fig.1.

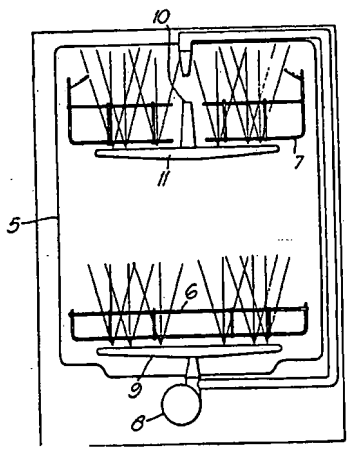

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Fig.1.

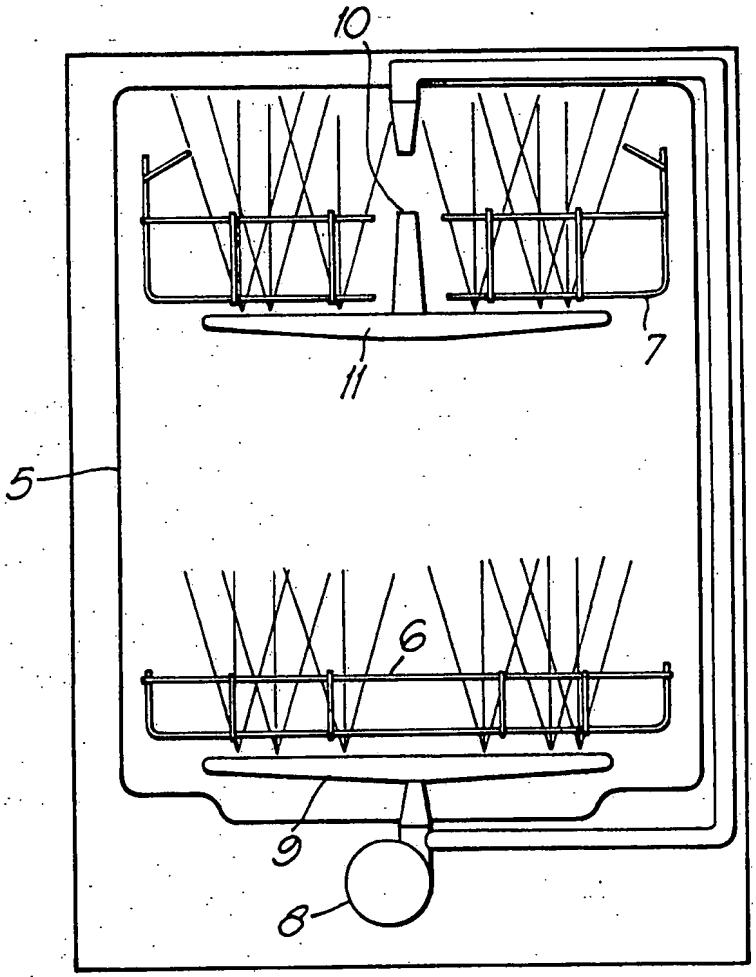


Fig.3.

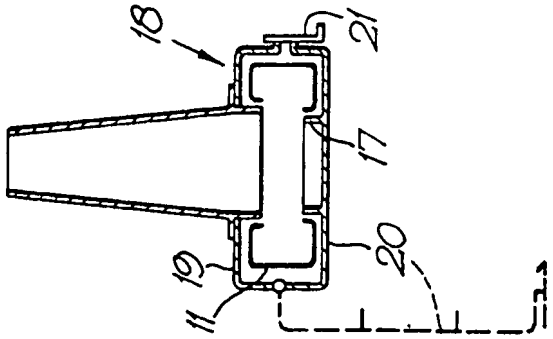


Fig.2.

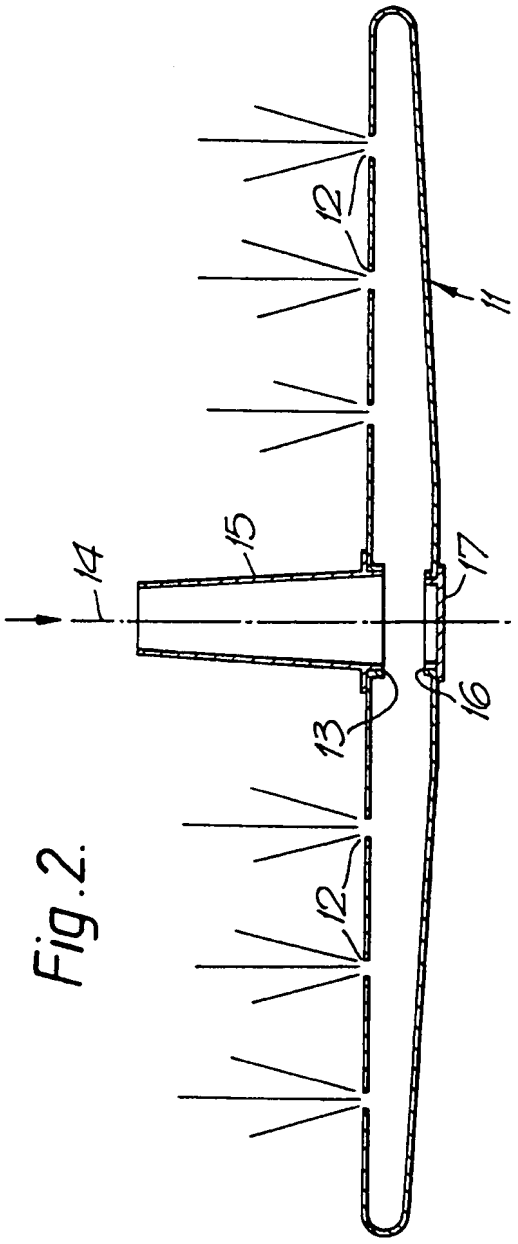
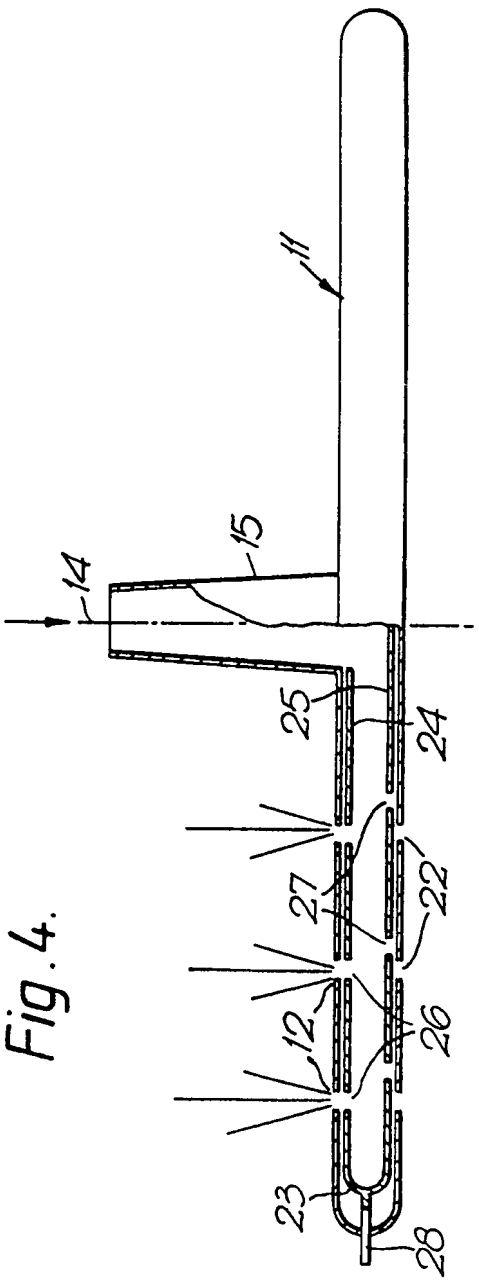


Fig.4.



DISHWASHER WITH ADJUSTABLE SPRAY NOZZLES

The present invention relates to a dishwasher of the type comprising a washing tub with an upper basket and a lower basket for carrying the articles to be washed.

Normally, disposed beneath each basket is an associated rotary member for directing jets of washing and/or rinsing water upwardly.

As is known, in certain cases the load of articles to be washed is made up of a reduced number of very dirty items which are preferably disposed in the lower basket only, where they can be simultaneously sprayed from below and from above.

For that purpose it is known, for example from EP-A-0 022 879, to provide the upper rotary member with spray nozzles which are disposed not only in its upper section but also in its lower section.

As will be appreciated, the upper nozzles of the upper rotary member are superfluous when the articles to be washed are disposed only in the lower basket while the lower nozzles of the same rotary member dissipate hydraulic energy needlessly when the items to be washed are disposed in both the baskets.

In conclusion, to attain adequate levels of washing performance in both cases, it is necessary for the circulating pump which feeds the rotary members to be undesirably over-dimensioned.

Attempts have been made to overcome those disadvantages, as described for example in IT-A-1 009 681, by using rotary members of conventional type and providing downwardly directed nozzles on a supply pipe for the upper rotary member, extending below the upper basket. The nozzles of the supply pipe are fixed and can be selectively closed off by means of manually operated members.

In that way it is possible to limit the degrees of

hydraulic dissipation when the articles to be washed are disposed in both the baskets and the nozzles of the supply pipe of the upper rotary member are closed.

In contrast, even with that construction the nozzles of the upper rotary member are substantially superfluous when the articles to be washed are disposed only in the lower basket. In addition, in that case the additional washing action of the fixed nozzles on the supply pipe occurs only over a delimited area.

In accordance with the invention, there is provided a dishwasher having adjustable spray nozzles, comprising a washing tub with at least one basket for carrying the articles, below which is disposed at least one rotary member provided with said nozzles, and manually actuable adjusting means for permitting switching of the nozzles between first and second operative positions in which they are capable of directing jets of water upwardly and downwardly, respectively.

As will become apparent from the following description, the invention provides a dishwasher with adjustable spray means, by way of which it is possible selectively to effect normal washing operations for articles disposed in both the baskets of the machine and intensive washing operations for articles disposed in only the lower basket, in an effective manner and with a constant hydraulic output and performance.

Preferably, the adjusting means comprise releasable coupling means, by way of which the rotary member is capable of being supported by a supply pipe, and a removable plug which can close a hole provided on the lower portion of the rotary member, coaxial with the axis of rotation and similar to a hole provided on the upper portion of the rotary member, by means of which the rotary member communicates with the supply pipe.

The features and advantages of the invention will be clearly apparent from the following description given solely

by way of non-limiting example with reference to the accompanying drawings in which:

Figure 1 is a diagrammatic view in section of the dishwasher according to the invention, provided with the basic components thereof,

Figures 2 and 3 are respective diagrammatic views in longitudinal and cross-section of a detail of the dishwasher in figure 1, in accordance with a preferred embodiment, and

Figure 4 is a diagrammatic view in partial section of an alternative form of the detail shown in figure 2.

Referring to figure 1, the dishwasher according to the invention comprises a washing tub 5 in which are disposed a lower basket 6 and an upper basket 7 for supporting the dishes to be washed.

A water recirculating pump 8 is operable to supply a rotary arm member 9 and, by way of an air gap 10, a rotary arm member 11.

In substance, the hydraulic circuit comprising the rotary members 9 and 11, the pump 8 and the associated connecting pipes can be designed as described for example in GB-A- 1 514 652.

In particular the rotary members 9 and 11 are disposed below the respective baskets 6 and 7 and are provided with spray nozzles which are normally operable to direct jets of water upwardly for washing moderately dirty articles (not shown) disposed in both the baskets.

In figure 2, the nozzles of the upper rotary member 11 are indicated at 12 and are disposed exclusively on the upper portion thereof. In conventional fashion, the rotary member 11 is hollow and is provided on its upper portion with a hole 13 coaxial with the axis of rotation 14 and by means of which it communicates with the associated supply pipe 15.

A further hole 16 which is coaxial and similar to the hole 13 is provided in the lower part of the rotary member

11 and is normally closed by a removable plug 17 which can be fitted with a force fit therein. The rotary member 11 is supported by the pipe 15, in communication therewith by way of the hole 13, and preferably fixed in respect of rotation by means of releasable coupling latching means comprising a housing-like holder or the like.

As shown in figure 3, the holder 18 preferably comprises a first portion 19 which is fixed with respect to the supply pipe 15 and a second portion 20 which is hinged to the first portion and which can be closed thereto by latching coup-ling means 21. Preferably the portion 20 of the holder 18 is made of plastics materials and the closure plug 17 is provided integrally thereon.

To sum up, the holder 18 and the removable plug 17 form means for regulating the jets 12, using manual actuation.

Whenever a reduced number of very dirty articles disposed in only the lower basket 6 are to be washed, it is possible to switch downwardly the jets of water emitted by the nozzles 12 by means of a simple manual operation. That operation involves opening the holder 18 by acting on the coupling means 21, at the same time removing the plug 17 from the hole 16 in the rotary member 11; the rotary member 11 is then inverted in position, communicating the hole 16 with the supply pipe 15; finally the holder 18 is closed again, at the same time closing off the hole 13 by means of the closure plug 17. At that point the dishwasher is operable, without dispersion and/or variations in the characteristics of the hydraulic circuit, concentrating the washing jets on the lower basket 16.

It will be appreciated that the above-described dishwasher may be the subject of many modifications within the scope of the invention as defined in the appended claims. For example the jet adjusting means may be of different types, depending of the requirements involved and in accordance with the characteristics of the hydraulic

circuit of the machine.

An embodiment which is particularly convenient in use is that shown in figure 4 in which the upper rotary member 11 is provided not only with nozzles 12 in the upper part but also with nozzles 22 in the lower part. Disposed within the rotary member 11 is a slider 23 comprising a jacket member or at least two walls 24 and 25 which are resiliently in contact with the walls of the rotary member 11 at positions corresponding to the nozzles 12 and 22. The walls 24 and 25 have two series of holes 26 and 27 which are disposed in such a way that in a first operative position of the slider 23 (as shown in figure 4) the holes 26 coincide with the upper nozzles 12 while the lower nozzles 22 are closed off by the wall 25.

In a second operative position of the slider 23 which may be horizontally (radially) or angularly displaced with respect to that shown in figure 4, the holes 27 communicate with the lower nozzles 22 in the rotary member 11 while the upper nozzles 12 are closed off by the wall 24.

Manual actuation of the slider 23 may be effected by means of a pin 28 or the like which is fixed with respect to the slider 23 and which protrudes from one end of the rotary member 11. Consequently, by simply acting on the pin 28, it is possible to provide that the upper rotary member 11 produces only upwardly directed jets of water, or only downwardly directed jets.

CLAIMS

1. A dishwasher having adjustable spray nozzles, comprising a washing tub with at least one basket for carrying the articles, below which is disposed at least one rotary member provided with said nozzles, and manually actuable adjusting means for permitting switching of the nozzles between first and second operative positions in which they are capable of directing jets of water upwardly and downwardly, respectively.

2. A dishwasher according to claim 1 wherein disposed on the upper portion of the rotary member are said nozzles and a first hole which is coaxial with the axis of rotation and by means of which the rotary member communicates with a supply pipe, and said adjusting means comprise releasable coupling means by way of which the rotary member is capable of being supported by the supply pipe, and a removable plug for closing a second hole coaxial with and similar to the first hole and provided on the lower portion of the rotary member.

3. A dishwasher according to claim 2 wherein said coupling means comprise a support holder formed by at least two releasable portions and on which said plug is integrally provided.

4. A dishwasher according to claim 1 wherein said nozzles are disposed on the upper portion and on the lower portion of the rotary member and the adjusting means comprise a slider which is normally capable of closing said nozzles and which is provided with holes and which can be switched manually between a first operative position in which the holes coincide with the upper nozzles and a second operative position in which the holes coincide with the lower nozzles

of the rotary member.

5. A dishwasher constructed and arranged to operate substantially as hereinbefore described with reference to and as illustrated in figures 1-3 or figure 4 of the accompanying drawings.

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9/6/2007, EAST Version: 2.1.0.14